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OPERATIONAL SUSTAINMENT - A MEANS, WAYS, AND ENDS PARADIGM GOVERNING JOINT MILITARY OPERATIONS

by

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The contents of this paper reflect my own personal views and are not necessarily endorsed by the Naval War College or the Department of the Navy.

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In the paradigm, operational sustainment is defined as applying the logistical means available in particular ways while minimizing risks to achieve desired ends. The operational sustainment paradigm is proposed as a useful model for examining campaigns and major operations in terms of a critical operational function.

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Abstract of

OPERATIONAL SUSTAINMENT - A MEANS, WAYS, AND ENDS PARADIGM GOVERNING JOINT MILITARY OPERATIONS

The impact of operational sustainment on campaigns/major operations in a semi-austere theater of operations is examined. The analysis begins with the theory of sustaining operations at the operational level of war, the principles of operational logistics and operational sustainment considerations. A paradigm is developed for examining operational sustainment as an essential and critical part of operational art.

In the paradigm, operational sustainment is defined as applying the logistical means available in particular ways while minimizing risks to achieve desired ends. Logistics (personnel, material, transportation, facilities and services) are the operational sustainment means. Logistics are applied using the sustainment activities (establishing bases, lines of communication, staging, prioritizing and expanding) as the sustainment ways. Risk is minimized by adhering to the principles of logistics (responsiveness, simplicity, flexibility, economy, attainability, sustainability and survivability).

The operational sustainment paradigm is proposed as a useful model for examining campaigns and major operations in terms of a critical operational function.

INTRODUCTION

> "Logistics is the foundation of our combat power. To meet our Nation's global responsibilities, our ability to move and sustain combat forces virtually anywhere in the world must be maintained."[1] GEN John Shalikashvili

In the above quote the chairman of the Joint Chiefs of Staff states the prominent role logistics and sustainment play in conducting joint military operations. The United States Armed Forces must be prepared to respond rapidly to crisis situations across the entire spectrum of conflict and in various regions of the world. During the past five years the United States has executed and is, in some cases, still conducting operations in such diverse areas as Southwest Asia, Somalia, Haiti and Bosnia. Missions spanned the spectrum from major regional conflicts to humanitarian assistance. These operationally and geographically diverse missions possessed a common theme. They were conducted in semi-austere areas of operations requiring major external logistical support in order to successfully sustain committed forces. We should expect no less in the future.

Operational sustainment is a critical operational function for the planning and execution of campaigns and major operations at the operational level of war. This paper examines the impact of operational sustainment on campaigns and major operations in a semi-austere theater of operations. Operation Desert Shield/Storm is used for historical analysis. The Persian Gulf War, a major regional conflict, is our most recent logistically demanding and complex joint military operation.

The analysis begins with the theory of logistics and sustainment at the operational level of war and the current doctrine for support of joint operations. A paradigm is developed for examining operational sustainment as an essential and critical part of operational art. The operational sustainment paradigm is applicable for conducting historical analysis and for planning future joint operations.

OPERATIONAL SUSTAINMENT-- THEORY AND DOCTRINE

> "The Operational Level of War links the tactical employment of forces to strategic objectives."[2] Joint Pub 3-0

The operational level of war is the level at which campaigns and major operations are planned, conducted and sustained within a theater of operations in order to accomplish operational objectives.[3] The key point in the definition above is that campaigns and major operations are planned, conducted and **sustained** (emphasis added). This analysis begins with a doctrinal explanation of the term operational sustainment and its relationship to logistics at the operational level of war. The Joint Military Operations Department references four fundamental questions which the CINC and his staff planners must be able to answer confidently at the operational level of war. [4] Applying these questions in terms of logistics and sustainment at the operational level of war provides the structure for developing the sustainment paradigm.

The first of the four questions is "What operations level goals or conditions must be achieved in order to meet the nation's strategic objectives?"[5] In other words, what are the ends? Joint Pub 1-02 defines sustainment as "the provision of personnel, logistics and other support required to maintain and prolong operations or combat until successful accomplishment or revision of the mission or of the national objective."[6] Ideally then, the operational sustainment end is the continuous support of the resources necessary to conduct the mission without loss of combat power. The military condition is continuous support using the means available to accomplish the operational objectives. What are the means necessary to accomplish the operational objectives? That is the answer to the next JMO question.

How should the resources of the force be applied and what are those resources at the operational level of war?[7] Logistics is defined as

> the science of planning and carrying out the movement and maintenance of forces. In its most comprehensive sense those aspects of military operations which deal with: a. design and development, acquisition, storage, movement, distribution, maintenance, evacuation and disposition of material; b. movement, evacuation and hospitalization of personnel; c. acquisition or construction, maintenance, operation and disposition of facilities; and d. acquisition or furnishing of services.[8]

More simply, operational logistics are the personnel, material, facilities, services and transportation means available to apply to the operating forces to achieve operational objectives in a theater of operations. Logistics are the means necessary to achieve the desired end. The logistical means must be applied in

a certain way to achieve the desired end.

In this case, the specific JMO question is "What sequence of actions must be planned and executed in order to reach those operational goals?"[9] The desired end or condition as discussed previously is the continuous support of operations without loss of combat power. In terms of operational sustainment it is the application of the means (logistics) using the sustainment activities of establishing bases, lines of communication, staging, prioritizing and expanding support to accomplish operational objectives. As defined in the Joint Military Operations Department Glossary of Operational Terms, Operational Sustainment

> establishes requirements for procuring resources from the sustaining base, establishing a forward base of operations, opening and maintaining lines of communication, providing intermediate bases of operations to support phasing (staging), establishing priorities for service and support (prioritizing), by phase (expanding), throughout the campaign.[10]

The proper sequence of action (ways) by which logistical resources (means) are applied at the operational level will support the desired goals or conditions (ends). There are risks associated with sustainment at the operational level of war. Reducing the risks will enhance operational success.

The fourth and final Joint Military Operations Department question asks, "What are the likely derivative costs and risks?"[11] The greatest cost is the inability to achieve the desired sustainment end, continuous support without loss of combat power. Possible causes are either an absence or shortage

of logistics (means) and/or the misapplication or sequence of actions (ways) used to achieve the operational sustainment objectives. Adhering to the principles of logistics as defined in Joint Pub 4-0 when planning and conducting joint military operations will minimize the risks inherent in sustainment at the operational level of war. The principles of logistics are responsiveness, simplicity, flexibility, economy, attainability, sustainability and survivability. They complement the principles of war and are not a checklist but serve as a guide to commanders and their staffs for planning and conducting logistic support for joint operations.[12] Risk avoidance enhances the objective of sustaining the employment concept of a combatant commander.

Operational art takes available means, applies them in a particular way while minimizing risk to achieve identified ends. Similarly, operational sustainment takes the logistical means available, applies them in a particular way while minimizing risk to achieve desired ends.[13] Using operational art and answering the four fundamental JMO questions in terms of the Operational Sustainment function provides the following analytical paradigm.

MEANS	+	WAYS	-	RISKS	=	ENDS
LOGISTICS	+	APPLICATION	-	RISKS	=	ENDS

(Personnel)	(Establishing bases)	(Responsiveness)	(Continuous
(Material)	(Lines of communication)	(Simplicity)	support
(Transportation)	(Staging)	(Flexibility)	without
(Facilities)	(Prioritizing)	(Economy)	loss of
(Services)	(Expanding)	(Attainability)	combat
		(Sustainability)	power)
		(Survivability)	

Personnel, material, transportation, facilities and services are the operational logistics as the means available to achieve the desired ends. The ways the logistical means available are applied using the sustainment activities of establishing bases, lines of communication, staging, prioritizing and expanding will impact immensely on the force's ability to conduct and support continuous operations without loss of combat power. Risk can be minimized by adhering to the principles of logistics.

LOGISTICS -- OPERATIONAL SUSTAINMENT MEANS

"The overall logistics effort to mobilize and support Desert Shield/Storm was herculean, especially in the weeks prior to initiating hostilities. The superb performance of the logistics community deserves high praise."[14] General H. Norman Schwarzkopf

During the Persian Gulf War, logisticians from all Services supported more than half a million personnel of the U.S. Armed Forces with material, transportation, facilities and services.[15] Over 300,000 logistical personnel provided the means necessary to sustain the force in theater. The logisticians' accomplishments were indeed significant considering our forces had essentially no infrastructure in the theater of operations. Virtually all means; personnel, material, transportation, services and facilities would have to be deployed to the Arabian Peninsula in order to conduct and sustain operations in an extremely harsh environment.

Personnel included over 539,000 U.S. service members in the Gulf Region by 1 March 1991. In terms of material, over 12,400 tracked and 117,000 wheeled vehicles, 1800 helicopters, 360 combat aircraft and 210 ships deployed into theater from the United States and Europe in just over 160 days.[16] In addition, the campaign plan required a 60-day stockage level of Class I, II, III, IV, V, VIII and IX supplies.[17]

Almost all of the personnel and material had to be transported into the theater of operations. The U.S. Transportation Command coordinated approximately 600 ship voyages and 10,000 aircraft flights to move the half-million service

members and 5.7 million metric tons of material from the United States and Europe into the theater of operations. Seventy-nine merchant ships of the Ready Reserve Fleet and one hundred Civilian Reserve Air Fleet aircraft were activated to augment the active duty transportation assets.[18] Once in theater, more than 1.3 billion ton miles of cargo moved from the ports to combat units. Transportation was a key sustainment means to deploy and support forces along supply lines that spanned halfway around the world.

There were some extensive port and airfield facilities such as Dhahran, Jubayl and Riyadh, but once outside these centers there was a very limited facilities infrastructure. To correct this deficiency, more than six hundred million dollars worth of support facilities were constructed during Desert Shield and Desert Storm.[19] Perhaps the most significant logistical achievement was in the area of services and supplies provided to U.S. forces. Their Iraqi counterparts suffered from a lack of the basic necessities of food and water required to maintain combat effectiveness. Logisticians provided 2.5 billion gallons of fuel, 95 million meals, 1.2 billion gallons of water and 44 thousand tons of mail during the Gulf War. U.S. forces even had Wolfburger stands and phone banks set up in the desert for their use during Desert Shield and Storm.[20]

These huge amounts of logistical means were the resources applied to achieve the desired ends of continuous support of the force without loss of combat power. The means were available to

conduct a sixty day ground and air campaign. To achieve success the logistical means available had to be applied in ways which were effective in achieving the endstate.

APPLYING LOGISTICS -- OPERATIONAL SUSTAINMENT WAYS

> "Operational logistics encompasses those support activities required to sustain campaigns and major operations."[21] FM 100-5

Operational logistics means are applied using the sustainment activities of establishing bases, lines of communication, staging, prioritizing and expanding support as the ways to achieve uninterrupted support throughout the major operation or campaign. The first sustainment activity during Desert Shield was establishing bases. U.S. forces established the bases of operations at the major ports and airfields in order to deploy forces and sustainment means into the theater of operations. Then prior to the initiation of the ground war, U.S. forces projected two large bases over 150 miles west of the ports to support the two Army Corps attack.[22] Establishing the forward logistics bases was a way to ensure continuous support of the combat forces.

U.S. forces selected and improved lines of communication into the theater of operations. Once in theater the Services established lines of support to their forward deployed forces. The Army's 22d Support Command provided the theater logistics responsibility of establishing the lines of communication for the reception, staging and onward movement of forces entering the

theater of operations.[23] Individual Services provided their own support within their capabilities. By staging forces and logistical means at forward bases and improving lines of support U.S. forces avoided overextending their lines of communication and reaching a culminating point during the ground offensive.

In addition to establishing bases, lines of communication and staging logistical resources, commanders can apply their logistical means more efficiently and effectively by establishing priorities of support. Prioritizing is a way to shift the logistical means available within the theater of operations to ensure continuous support of the main effort, to exploit an operational situation or to prepare for future operations.[24] A major challenge during Desert Shield/Storm was prioritizing the deployment of logistical resources into the theater of operations. The initial mission to deter further Iraqi aggression and defend Saudi Arabia required massive combat power quickly but was supported by an austere logistics base. As force levels increased and priorities changed, the logistical resources expanded into a vast network of bases and lines of communication in the theater of operations. With the deployment of large numbers of additional combat forces from the United States and Europe in preparation for Desert Storm, U.S. forces rapidly expanded into a robust logistics structure. The logistics base infrastructure was tailored to support the operation, to expand rapidly and keep pace with support requirements.[25] During the Persian Gulf War U.S. forces applied the logistical resources

available using the five sustainment activities of establishing bases, lines of communication, staging, prioritizing and force expansion. U.S. forces apply the logistical means available using the sustainment activities as the ways to achieve continuous support. Adhering to the principles of logistics will minimize operational risk to obtain sustainment ends.

PRINCIPLES OF LOGISTICS -- REDUCING SUSTAINMENT RISK

> "When an army begins an operation, whether it is to attack the enemy and invade his theater of war or to take up positions along its own borders, it necessarily remains dependent on its sources of supply and replenishment and must maintain communications with them."[26] Clausewitz, On War.

Carl von Clausewitz' words are as cogent today as when written. The logistical means available and the way they are applied using the five sustainment activities must support the operational objectives in order to achieve success. Yet, the friction of war produces unforeseen difficulties which often impede achievement of desired ends. Minimizing the impact of this friction on sustainment operations reduces the risk of not achieving continuous support without loss of combat power. Understanding and following the principles of logistics during the planning and execution of sustainment operations can minimize risk.

Responsiveness is the right support in the right place at the right time and it is the keystone logistics principle.[27] It is imperative that the operational sustainment system support the commander's operational concept. The operational sustainment

function must be responsive to the other operational functions. The ability of the operational sustainment function to support the sweeping left hook of two Army Corps deep into Iraq demonstrates the importance of logistical responsiveness to support an operational plan. By G-Day, 24 February, there were sufficient stockage of all classes of supply in forward logistic bases to support the operational concept.[28] This minimized the risk to the force of not being able to achieve its operational objectives due to a lack of logistical support.

Simplicity is avoidance of complexity through standardized procedures, mission-type orders and establishment of priorities.[29] Logistical support and sustainment during the Persian Gulf War was not a simple operation considering the amount of logistics that flowed into the theater of operations between August 1990 and March 1991. Standardization without stifling innovation and individual initiative were important reasons for successfully supporting an operation of this magnitude.[30] Complex operational sustainment systems complicate support plans and increase the risk that support will be interrupted with a loss of combat power.

Flexibility adapts logistic structures and procedures to changing situations, missions and concepts of operations. There must be positive command and control over subordinate organizations.[31] An example of this flexibility is the case of the theater Support Command (SUPCOM) which developed from a zero base in August 1990 to over 40,000 personnel in February 1991

with a mission of receipt, forward movement and sustainment of all forces in Saudi Arabia. SUPCOM was flexible by tailoring doctrine to provide for prompt and complete logistical support in the Southeast Asia theater of operations.[32]

Economy is the provision of support at the least cost which must be considered when allocating and prioritizing limited resources.[33] Economy makes the best use of the limited logistical means available by applying them efficiently and effectively. During the Persian Gulf War U.S. forces had enough 120-mm tank ammunition to destroy 10 times the number of armored vehicles Iraq possessed.[34] Although this greatly reduced the risk to U.S. forces it did not adhere to the logistics principle of economy.

Attainability provides the minimum essential supplies and services required to begin combat operations.[35] Determining the base line logistical means required to achieve success reduces the risk that an operation will prematurely reach a culminating point. Prior to the start of ground operations during Operation Desert Storm the logistical resources were adequate to provide continuous support of anticipated operations. Sustainability maintains logistic support to all users throughout the theater for the duration of the operation.[36] Attainability focuses on minimum logistical support requirements while sustainability focuses on long-term logistical support requirements. Complying with the principles of sustainability reduces the risk that logistical support will be interrupted.

Survivability is the capacity of the organization to prevail in the face of potential destruction.[37] Conducting active and passive defense measures enhances the survivability of logistical forces. Logistical force protection minimizes the risk to operational sustainment objectives. SUPCOM moved most logistical resources used to support ground operations after the start of offensive air operations into Iraq. This action protected the force during movement to the west. It reduced the risk to the force of Iraqi observation and interdiction. Using the principles of logistics when planning and conducting joint operations will minimize risk to achieve operational sustainment objectives.

CONCLUSION

Logistics and sustainment are of critical importance when planning and conducting joint military operations in an austere environment. The operational sustainment paradigm applied the theory of operational art to the central issues of means, ways, risk and ends. The operational sustainment end is to provide continuous support without loss of combat power. Logistics are the means to achieve the end. The correct application of the means using the sustainment activities will enhance achievement of the desired end. Adhering to the principles of logistics will minimize risk inherent in all operations. Operational sustainment is a critical function and may be the governing factor at the operational level of war.

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